Amendments to the Claims:

1. (Original) A water soluble polymer comprising:

(i) a first water soluble polymer segment having at least 4 and at most about 2000 monomeric units ($POLY_A$);

(ii) a second water soluble segment comprising 1 to about 120 monomeric units ($POLY_B$), which has a lower molecular weight than that of $POLY_A$ and is covalently attached to $POLY_A$ through a linkage X; and

(iii) a functional group, Y, attached to $POLY_A$ or $POLY_B$;

wherein each of $POLY_A$ and $POLY_B$ independently comprises one monomer or up to three different monomers selected from the group consisting of alkylene glycol, olefinic alcohol, vinylpyrrolidone, hydroxyalkylmethacrylamide, hydroxyalkylmethacrylate, saccharide, α-hydroxy acid, phosphazene, oxazoline, and N-acryloylmorpholine.

2. (Original) The polymer of claim 1, wherein the molecular weight of $POLY_A$ is at least twice that of $POLY_B$.

3. (Original) The polymer of claim 1, wherein $POLY_A$ has at most about 200 monomeric units.

4. (Original) The polymer of claim 1, wherein $POLY_A$ has at most about 125 monomeric units.

5. (Original) The polymer of claim 1, wherein $POLY_A$ has at most about 25 monomeric units.

6. (Original) The polymer of claim 1, wherein said functional group is located on $POLY_B$.

7. (Original) The polymer of claim 1, wherein $POLY_B$ comprises at least 2 monomeric units.

8. (Original) The polymer of claim 1, wherein $POLY_A$ and $POLY_B$ have the same monomeric composition.

9. (Original) The polymer of claim 1, wherein each of $POLY_A$ and $POLY_B$ is a poly(alkylene glycol).

10. (Currently amended) The polymer of claim 9 ~~11~~, wherein each of $POLY_A$ and $POLY_B$ is a poly(ethylene glycol).

11. (Original) The polymer of claim 1, wherein X comprises an amide linkage, a carbonate linkage, a urea linkage, or a carbamate linkage.

12. (Original) The polymer of claim 1, wherein said functional group Y comprises a nucleophilic group, selected from hydroxyl, amine, hydrazine, hydrazide, and thiol, or an electrophilic group, selected from carboxylic acid, carboxylic ester, imide ester, orthoester, carbonate, isocyanate, isothiocyanate, aldehyde, ketone, thione, alkenyl, acrylate, methacrylate, acrylamide, sulfone, maleimide, disulfide, iodo, epoxy, sulfonate, thiosulfonate, silane, alkoxysilane, halosilane, and phosphoramidate.

13. (Original) The polymer of claim 12, wherein said nucleophilic group is selected from amine, hydrazine, hydrazide, and thiol.

14. (Original) The polymer of claim 12, wherein said electrophilic group is selected from maleimide, succinimidyl ester or carbonate, benzotriazole ester or carbonate, imidazoyl ester or carbonate, glycidyl ether, vinyl sulfone, p-nitrophenyl carbonate, tresylate, acrylate, aldehyde, and orthopyridyl disulfide.

15. (Original) The polymer of claim 10, wherein the linkage X comprises a carbamate, an amide, a urea, or a carbonate, $POLY_A$ is end-capped with a capping group selected from C_1-

C_{20} alkoxy, C_1-C_{20} aryloxy, and a phospholipid, and the functional group Y is attached to $POLY_B$.

16. (Original) The polymer of claim 15, wherein the capping group is C_1-C_5 alkoxy.

17. (Original) The polymer of claim 15, wherein the capping group is derived from distearoylphosphatidylethanolamine (DSPE).

18. (Original) The polymer of claim 15, wherein the functional group is an amine.

19. (Original) A polymer as provided in claim 18, having the structure:

$$CH_3O\text{-}(CH_2CH_2O)_n\text{-}(CO)NH\text{-}CH_2CH_2OCH_2CH_2OCH_2CH_2NH_2$$

20. (Original) The polymer of claim 19, having a molecular weight selected from about 1000, about 5000, about 10000, and about 20000.

21. (Original) The polymer of claim 15, wherein $POLY_A$ has a molecular weight of about 1000.

22. (Original) A conjugate comprising a polymer of claim 1 and a pharmacologically active agent covalently attached to the polymer.

23. (Original) The polymer of claim 10, wherein the polymer has a structure selected from:

$$(PEG_A\text{–}X\text{–}PEG_B)_p\text{–}L\text{–}Y \qquad \textbf{(IIa)}$$

$$(PEG_A\text{–}X)_p\text{–}L\text{–}PEG_B\text{–}Y \qquad \textbf{(IIb)}$$

and

$$(PEG_A)_p\text{–}L\text{–}X\text{–}PEG_B\text{–}Y \qquad \textbf{(IIc)}$$

wherein:

PEG_A represents poly(ethylene glycol) comprising at least 4 and at most about 2000 $-CH_2CH_2O-$ monomeric units,

X is a covalent linkage,

L is a branched spacer group;

PEG_B represents poly(ethylene glycol) comprising at least 1 and at most about 120 $-CH_2CH_2O-$ monomeric units, with the proviso that PEG_B has a lower molecular weight than that of PEG_A;

Y is a functional group, and

p = 1 to about 100.

24. (Original) The polymer of claim 23, wherein PEG_A comprises at most 200 $-CH_2CH_2O-$ monomeric units.

25. (Original) The polymer of claim 23, wherein X comprises a carbamate, an amide, or a carbonate.

26. (Original) The polymer of claim 23, where p is 2 to about 10.

27. (Original) The polymer of claim 26, wherein p = 2.

28. (Original) The polymer of claim 10, wherein the polymer has a structure selected from:

$$PEG_A\text{–}L\text{–}(X\text{–}PEG_B\text{–}Y)_q \qquad \textbf{(IIIa)}$$

$$PEG_A\text{–}X\text{–}L\text{–}(PEG_B\text{–}Y)_q \qquad \textbf{(IIIb)}$$

and

$$PEG_A\text{–}X\text{–}PEG_B\text{–}L\text{–}(Y)_q \qquad \textbf{(IIIc)}$$

wherein:

PEG_A represents poly(ethylene glycol) comprising at least 4 and at most about 2000-CH_2CH_2O- monomeric units,

X is a covalent linkage,

L is a branched spacer group;

PEG_B represents poly(ethylene glycol) comprising at least 1 and at most about 120 $-CH_2CH_2O-$ monomeric units, with the proviso that PEG_B has a lower molecular weight than that of PEG_A;

Y is a functional group, and

q = 1 to about 100.

29. (Original) The polymer of claim 28, wherein PEG_A comprises at most 200 $-CH_2CH_2O-$ monomeric units.

30. (Original) The polymer of claim 28, wherein X comprises a carbamate, an amide, or a carbonate.

31. (Original) The polymer of claim 28, where 1 is 2 to about 10.

32. (Original) The polymer of claim 31, where 1 = 2.

33. (Original) The polymer of claim 10, wherein the polymer is a multi-arm polymer having the structure

$$M\text{-}\{PEG_A\text{-}X\text{-}(PEG_B\text{-}Y)_q\}_x$$

wherein:

M represents a multivalent core structure;

PEG represents poly(ethylene glycol) comprising at least 4 and at most about 2000 $-CH_2CH_2O-$ monomeric units;

X is a covalent linkage;

PEG_B represents poly(ethylene glycol) comprising at least 1 and at most about 120 $-CH_2CH_2O-$ monomeric units, with the proviso that PEG_B has a lower molecular weight than that of PEG_A;

Y is a functional group;

q = 1 to about 10; and

x = 3 to about 100.

34. (Original) The polymer of claim 33, wherein PEG represents poly(ethylene glycol) comprising at most 200 $-CH_2CH_2O-$ monomeric units.

35. (Original) The polymer of claim 33, wherein q = 1 or 2.

36. (Original) The polymer of claim 33, wherein M is selected from a polyol and a polyamine.

37. (Original) A hydrogel comprising a polymer of claim 1.

38. (Original) The hydrogel of claim 37, wherein said hydrogel is crosslinked.

39. (Original) A method of forming a water soluble polymer comprising two or more segments, said method comprising the steps of:

reacting a first water soluble polymer segment, having at least 4 and at most about 2000 monomeric units and having at least one first functional group Z, with a second water soluble segment, having from 1 to about 120 monomeric units and having at least one second functional group Y', thereby forming a covalent linkage between said first and second segments by reaction of said first and second functional groups; wherein:

said second segment has a lower molecular weight than said first segment;

either said first or said second segment further comprises an additional functional group Y that is not readily reactive with either said first or said second functional group, and

each of said first and second segments independently comprises one monomer or up to three different monomers which are selected from the group consisting of alkylene glycol, olefinic alcohol, vinylpyrrolidone, hydroxyalkylmethacrylamide, hydroxyalkylmethacrylate, saccharides, α-hydroxy acid, vinyl alcohol, polyphosphazene, polyoxazoline, and N-acryloylmorpholine.

40. (Original) The method of claim 39, wherein each of said first and second functional groups independently comprises a group selected from amine, hydrazide, hydroxyl, succinimidyl ester or carbonate, benzotriazole ester or carbonate, glycidyl ether, imidazolyl ester or carbonate, p-nitrophenyl carbonate, aldehyde, maleimide, ortho-pyridyl disulfide, acrylate, tresylate, isocyanate, and vinyl sulfone.

41. (Original) The method of claim 39, wherein said covalent linkage comprises an amide, an ester, an carbamate, or a urea.

42. (Original) The method of claim 39, wherein said additional functional group comprises a group selected from hydroxyl, amine, hydrazine, hydrazide, thiol, carboxylic acid, carboxylic ester, imide ester, orthoester, carbonate, isocyanate, isothiocyanate, aldehyde, ketone, thione, alkenyl, acrylate, methacrylate, acrylamide, sulfone, maleimide, disulfide, iodo, epoxy, sulfonate, thiosulfonate, tresylate, silane, alkoxysilane, halosilane, and phosphoramidate.

43. (Original) The method of claim 39, wherein said second segment comprises said additional functional group.

44. (Original) The method of claim 39, wherein each of said first and said second segments is a polyethylene glycol.

45. (Original) The method of claim 39, further comprising the step of conjugating a pharmacologically active agent to said water soluble polymer via reaction of said additional functional group Y.

46. (New) The polymer of claim 10, wherein each of $POLY_A$ and $POLY_B$ is linear, $POLY_A$ has a molecular weight range selected from about 200-5000, $POLY_B$ has at least two monomeric units, linkage X comprises an amide linkage, and each of $POLY_A$ and $POLY_B$

has an attached functional group Y, said functional groups comprising an amine or protected amine.

47. (New) The polymer of claim 46, wherein $POLY_A$ has at least 100 monomeric units.

48. (New) The polymer of claim 47, wherein $POLY_B$ has 2 monomeric units.